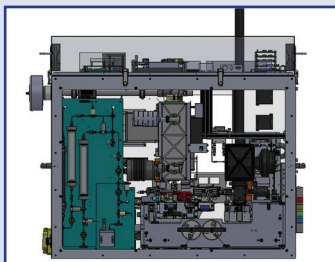


# Science & Engineering Services, Inc. - Chemical-Biological Detection System (CBDS)



## GENERAL DESCRIPTION:

The Chemical-Biological Detection System (CBDS) is sized and designed to deliver next generation capabilities beyond the current CBMS Block II. CBDS utilizes an integrated mass analyzer for analysis and identification of CWA, TIC and BWA materials; with collection of CWA, TIC and BWA hazards accomplished via air-stack as well as collection of CWA and TIC hazards via ground probe and/or direct injection. A key attribute of CBDS is the ability to create and transfer library updates of new hazards and/or unknowns within a few hours. In terms of logistics, the consumables cost per sample is less than one dollar and train-up for non-technical users is one day.



## TECHNICAL DESCRIPTION:

The Chemical-Biological Detection System (CBDS) uses a hexapole ion-trap mass spectrometer in which MS/MS is conducted either via AP-MALDI of biological samples or via chemical ionization of chemical samples. Biological materials undergo automated single-spot proteomic processing and MS/MS targeted bio-marker analysis to sift rapidly thru clutter against specialized-onboard and/or commercial internet-accessible databases. Chemical materials undergo similar steps, less single-spot proteomics processing.

## CONTACT INFORMATION

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## COST

- \$350,000/system
- <\$1/analysis

## Tier Selection

Final tier assignment is based on overall product score.

- Top Tier
- Second Tier
- Third Tier
- ◐ Fourth Tier
- Bottom Tier

### RANKINGS

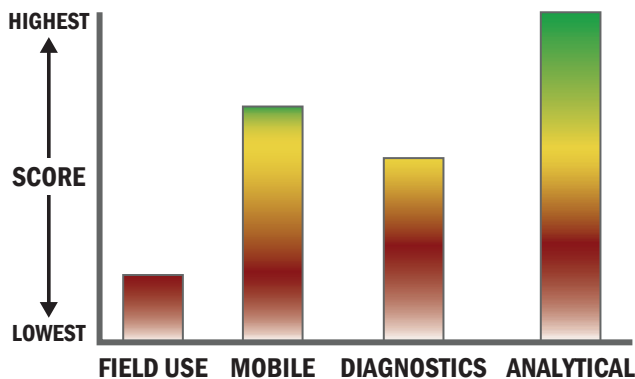
	Biological	Chemical	Radiological
<b>FIELD USE System</b>			
<b>MOBILE Laboratory</b>			
<b>DIAGNOSTIC Laboratory</b>			
<b>ANALYTICAL Laboratory</b>			

## Survey Source

Vendor Supplied Information

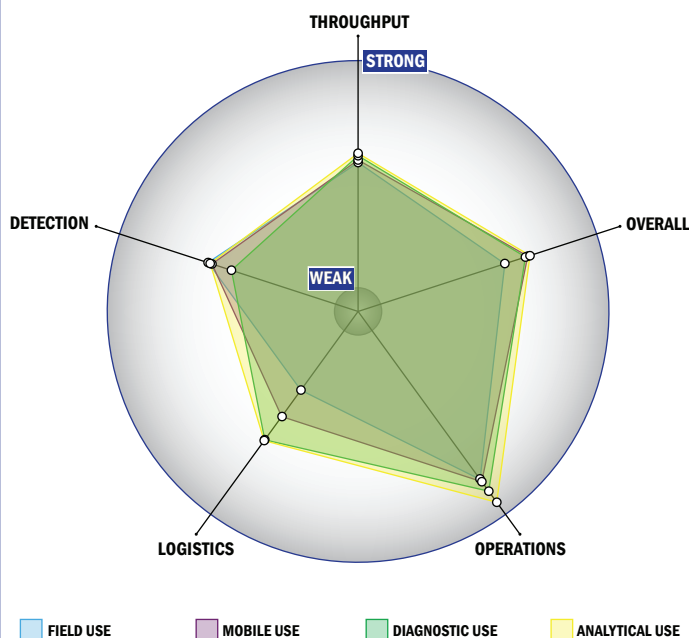
## Scoring Analysis

System scores are compared across the four scenarios and ranked from highest to lowest.



## Impact Chart

The Impact Chart is a spider graph representing specific categories and designed to give the reader a visual depiction of how a particular system is expected to operate across the four different scenarios. The score for each of the seven categories is presented as the percentage of the total possible score. Higher category scores extend the spokes of a graphic toward the outer edge of the chart. The area graphed for each of the four scenarios relates to how well the system performed in that scenario. Graphics for each of the four scenarios are super-imposed for ease of comparison.



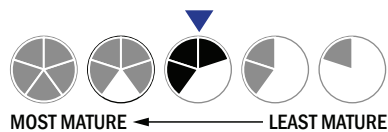
## Evaluation Criteria

### Throughput:

- Between 2 and 15 minutes for detection
- Multiple samples, multiple tests/sample per run
- 95-32 samples every 2 hours
- The system or device is currently fully automated
- Device or system is intended for multiple detection assays
- 3 solutions, buffer, eluents, and/or reagents
- 1 component
- 10-20 minutes is required for set-up
- 1-2 steps are required for detection

### Logistics:

- An afternoon of training and some technical skills required
- Approximately the size of a home dishwasher
- More than 50 kg
- Satellite and wired connections are available
- System or device has 110V electrical requirement



### Operations:

- Can be used from 4 °C to 41 °C
- Components must be stored at 4 °C
- Performance is not influenced by relative humidity
- Between 1 to 3 years shelf life
- Greater than 10 years expected life
- Results can be viewed in real-time
- The system or device is currently fully autonomous
- The system software is open and available for modification
- The system hardware is open and available for modification

### Detection:

- Not possible for the system to achieve 510K clearance
- Possible the system could receive FDA approval, no current efforts at this time
- Less than 10 µL
- Excellent specificity. System has occasional false alarms under certain conditions (<2%)
- 1,000-10,000 CFU per mL
- 1,000-10,000 PFU per mL
- 10-100 ng per mL
- Fully automated spore lysis
- $1 \times 10^{-4}$  -  $1 \times 10^{-3}$  mg/m<sup>3</sup>
- 1 ppb - 1 ppm
- System can currently identify aerosolized chemical agent
- System can currently identify liquid chemical agent

